



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,682	12/28/2001	Daniel P. Johnson	(256.114US1)	7301
21186 7590 09/15/2008 SCHWEGMAN, LUNDBERG & WOESSNER, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402				
EXAMINER				
MEINICKE DIAZ, SUSANNA M				
ART UNIT		PAPER NUMBER		
3692				
MAIL DATE		DELIVERY MODE		
09/15/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/032,682

Applicant(s)

JOHNSON, DANIEL P.

Examiner

Susanna M. Diaz

Art Unit

3692

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 25, 2008 has been entered.

Claims 1-21 are presented for examination.

2. The Board decision rendered May 27, 2008 affirmed the rejections set forth below. The Examiner maintains the affirmed rejections and addresses the minor amendments made to the claims below.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

35 U.S.C. § 101 requires that the claims produce a final result that is useful, concrete, and tangible.

According to the utility requirement, the claimed invention has to be specific, substantial, and credible. Claims 1-21 are directed toward a mathematical formula without any specific, substantial, or credible result. The formula is never applied to yield a particular practical application. While claims 2-5 recite that the solution is a schedule for a manufacturing process, a schedule for operating an oil refinery, a plan for a manufacturing process, and a plan for operating an oil refinery, respectively, the claimed invention does not clarify how the mathematical operations are specifically adapted to yield a specific, substantial, or credible result in relation to a schedule or plan for a manufacturing process or for operating an oil refinery.

As per the tangibility requirement, the claimed invention must set forth a practical application that produces a real-world result. As discussed above, the claimed invention recites a mathematical formula without applying the formula to a specific practical application with a real-world result. Even though claims 1-5 generally recite potential applications of the mathematical formula, there is never any express connection made between the equations and how they yield any results relevant to scheduling or planning. In other words, it is never made clear how the recited equations are adapted to a real-world application. Without relating the equation variables to a particular application that yields a result specific to that application, the equations are meaningless in a real-world context.

Regarding the concreteness requirement, the claimed invention must produce a result that is substantially repeatable or reproducible. Again, as discussed above, there is no meaningful result produced by the claimed invention. Consequently, the

mathematical formula *per se* is abstract and, without any understanding of what the recited variables represent, the results of the claimed invention are not substantially repeatable or reproducible. Even application of a solution when the solution is optimal and feasible (e.g., as recited in the independent claims) fails to remedy the issue of concreteness because it is not clear how a solution is consistently applied nor is it clear how a solution is determined to be optimal and feasible for a specific application in a particular field of use.

Claims 1-21 fail to produce a useful, concrete, and tangible result and are therefore deemed to be non-statutory.

Comiskey explains that mental processes *per se* are not statutory under § 101. Mental processes must be tied into some other category of statutory subject matter in order to be potentially patentable under § 101. *Comiskey* specifically states, "However, mental processes -- or processes of human thinking -- standing alone are not patentable even if they have practical application." (See *In re Comiskey*, 84 USPQ2d, at 1678) *Comiskey* continues with the rationale that "the patent statute does not allow patents on particular systems that depend for their operation on human intelligence alone, a field of endeavor that both the framers and Congress intended to be beyond the reach of patentable subject matter. Thus, it is established that the application of human intelligence to the solution of practical problems is not in and of itself patentable." (See *In re Comiskey*, 84 USPQ2d, at 1679) Claims 1-5 and 12-21 are directed toward a mental process that is totally reliant on the operation of human intelligence alone and the process recited in these claims is not tied to another statutory

class nor does it transform underlying subject matter to a different state or thing; therefore, claims 1-5 and 12-21 do not fall into one of the statutory categories recognized as patentable under 35 U.S.C. § 101. It is noted that the method/process of claims 1-5 and 12-21 is "computer-implemented"; however, the recitation "computer-implemented" has not been given patentable weight because the recitation occurs only in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding the concreteness requirement under 35 U.S.C. § 101, the claimed invention must produce a result that is substantially repeatable or reproducible. As discussed above, there is no meaningful result produced by the claimed invention. Consequently, the mathematical formula *per se* is abstract and, without any understanding of what the recited variables represent, the results of the claimed invention are not substantially repeatable or reproducible. The Examiner has looked toward the specification for clarification of an intended practical application. While the specification generally states that the invention is used for scheduling or planning and provides some examples of specific applications (pages 4-11 of the specification), the details of the mathematical equations used as part of the invention as addressed on pages 11-42 of the specification are very generic in nature and never explain the significance of each variable with respect to each possible application of the equations. Consequently, one of ordinary skill in the art would not have known at the time of Applicant's invention how to make and/or use Applicant's intended invention. Even application of a solution when the solution is optimal and feasible (e.g., as recited in the independent claims) fails to remedy the issue of repeatability because it is not clear in the original disclosure how a solution is consistently applied nor is it clear how a solution is determined to be optimal and feasible for a specific application in a particular field of use.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-21 are directed toward solving equations that are based on variables, relationships, and constraints that are never explicitly defined. Consequently, the intended metes and bounds of the claimed invention cannot be assessed. Without any particular context attributed to these variables, relationships, constraints, and equations, the scope of the claimed invention is ambiguous. The claims are very nebulous and abstract in nature; therefore, the Examiner is unable to focus on a clear and defined invention. For example, claims 2-5 recite that the solution is for a schedule or plan. How is a schedule or plan created merely by solving a set of non-convex equations and determining whether a solution is optimal, feasible, or infeasible? How is such an analysis applied to produce meaningful results in relation to a schedule or plan?

Claim 1 recites, "when the solution is optimal and feasible, applying the solution to the scheduling problem to a manufacturing process to produce a manufactured product." Claim 6 recites, "upon finding the solution to the scheduling problem to be optimal or feasible, applying the solution to a manufacturing process to produce a manufactured product." Claim 12 recites, "upon determining the solution to the scheduling problem is optimal or feasible, applying the solution to the scheduling problem to a manufacturing process to produce a manufactured product." Again, the metes and bounds of "applying the solution to a manufacturing process" are unclear since the claims do not clearly set forth how the solution is achieved nor how a solution

is determined to be optimal and feasible for a specific application in a particular field of use.

Please clarify the intended scope of the “global subdivision search.” Does this term refer to an algorithm or mathematical operation invented by Applicant or is it a synonym for a well-known algorithm or mathematical operation, such as one relating to subdivision and global optimization or branch-and-bound algorithms for global optimization? For examination purposes, it will be assumed to be one of the well-known options.

Under 35 U.S.C. § 112, 2nd paragraph, Applicant is required to clearly point out and distinctly claim the intended invention. This requirement has not been met.

Appropriate correction is required.

In light of the numerous rejections under 35 U.S.C. § 101 and 112, 1st and 2nd paragraphs, the following art rejection reflects Examiner's best understanding of the claimed invention.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-21 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hillier et al. (Introduction to Operations Research (6th ed)).

The claimed invention recites various old and well-known optimization techniques in the area of operations research, without any specific details of how these techniques are applied to a particular problem. The claimed techniques are addressed throughout Hillier. The table of contents and index as well as chapters 2, 3, and 13 have been provided to show the core concepts addressed by the claimed invention.

Regarding the step of "determining whether a solution to the scheduling problem is optimal, feasible, or infeasible," Hillier discusses a general approach for determining whether the solutions of a model are feasible or infeasible (see page 35). The goal is to identify an optimal solution (see page 36). Pages 57-60 of Hillier apply this analysis to a specific scheduling problem to find an optimal solution. Pages 62-63 of Hillier set forth a case study in a manufacturing environment for choosing a product mix on a monthly basis, which is also a type of scheduling problem. Also discussed (on pages 65-67 of Hillier) is an example of planning supply, distribution, and marketing at Citgo Petroleum Corporation (which manages oil refineries). Planning supply and distribution would necessarily require scheduling at some level.

The recitation of an ice cream product in claim 21 is indicative of a field of use. The fact that the manufactured product is ice cream does not affect any recited structure or manipulative steps of the invention; therefore, such a recitation will not patentably distinguish the claimed invention over the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the

claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susanna M. Diaz whose telephone number is (571) 272-6733. The examiner can normally be reached on Monday-Friday, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kambiz Abdi can be reached on (571) 272-6702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Susanna M. Diaz/
Primary Examiner, Art Unit 3692